


## Estimation of the Spatial and Temporal Covariances of Mt. Pinatubo Aerosol Extinctions from SAGE-II and CLAES Measurements

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The June 1991 eruption of Mt. Pinatubo has presented a rare opportunity to compare the chemical, radiative, and dynamical responses predicted by atmospheric models with *in situ* and satellite measurements. However, the accomplishment and comparison of such modeling efforts requires the availability of spatially complete and temporally continuous sets of aerosol optical properties and surface areas. These requirements are in sharp contrast to any single set of measurements.

The problem of merging measurements from multiple instruments with *a priori* knowledge to obtain the best estimate of time and spatially varying fields has an extensive statistically-oriented literature. Statistical interpolation techniques use pre-calculated spatial covariances to derive optimum interpolation schemes. Kalman filters often use temporal (lag) covariances to weight forecasts based on decaying persistence relative to new measurements. In Kinnison *et al.* (1994) we used such techniques to derive time-dependent zonally-averaged extinction profiles. In that work, we used constant global average covariances estimated from SAGE-II profiles and observed aerosol lifetimes. In this presentation we extend our work by developing time and spatially varying covariance fields from SAGE-II and CLAES measurements.

Kinnison, D.E., K.E. Grant, P.S. Connell, D.A. Rotman, and D.J. Wuebbles, 1994: The chemical and radiative effects of the Mt. Pinatubo eruption, *J. Geophys. Res.*, 99 (D12), 25,705-25731.

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## Submittal Information

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4. A
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